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gh. This degree of crystallinity is, of urse, indicated to some degree by the lking value.

So as to obtain reproducible thickenng, it is essential to keep the water conntration in the soap below 1.0 per nt and metals which function as oxidain catalysts must be kept at trace conntrations in order to secure good oxidain stability. Further, cations and ions which are not deleterious because prooxidant catalytic activity can conbute undesirable instability to lithium p greases so far as consistency and eding is concerned.

So as to avoid an uncontrolled amount gelatin, a limited quantity of free tty acid is required, usually 0.1 per nt minimum and 0.25 per cent maxium (as oleic) proving satisfactory. A mperature of approximately 390° F. usually adequate to disperse the soap the oil, rapid cooling of the mixture oducing an acceptable product.

Sodium Soaps

Sodium soaps, because sodium is a monovalent metal, are much simpler to prepare than those of polyvalent metals but the physical chemistry of their hydrocarbon solutions is quite as complicated. Simple neutralization of the usual monobasic acids produces either the normal salt or acid salt depending on the amount of sodium hydroxide used.

Dehydration to the anhydrous soap then produces a base material for thickening hydrocarbons.

Heating the anhydrous sodium soap to a high temperature with the oil, however, does not produce a desirable grease structure in the absence of glycerol. However, when a small percentage of water is present in the same mass, solution of the soap at high temperature is noted with the formation of an acceptable gel on cooling.

It would appear the peptization is the most important factor in this activity but the formation of hydrates causing a substantial change in the phase diagram also probably occurs. Work with sodium oleate [9] has demonstrated that peptization alone was adequate to cause development of an acceptable structure with the soap of such an unsaturated acid.

9. Rhodes, F. H., and Allen, H. D., Ind. Eng. Chem., 25 (11), 1274 (1933).
10. Puddington, I. E., Inst. Spokesman, 9 (9), 1

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